

MAP4C Mathematics Exam Review

Trigonometry

I should be able to

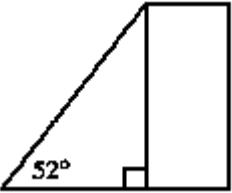
- solve problems in two dimensions by determining the measures of the sides and angles of right triangles using the primary trigonometric ratios, and of acute triangles using the sine law and the cosine law
- make connections between primary trigonometric ratios (i.e., sine, cosine, tangent) of obtuse angles and of acute angles, through investigation using a variety of tools and strategies
- solve problems involving oblique triangles, including those that arise from real-world applications, using the sine law (in non ambiguous cases only) and the cosine law, and using metric or imperial units

Vocabulary

Test Correction Notes

3

The angle from the ground to the top of a building is  $52^\circ$  at a distance of  $150\text{ m}$  from the building. Find the height of the building to the nearest meter.



192 m

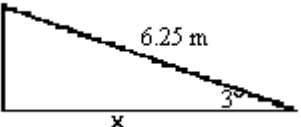
4

An airplane is flying at an altitude of 9000 m. The pilot wants to make a smooth final descent to the runway at a constant angle of depression of  $4^\circ$ . How far from the runway should the pilot begin the descent?

128 706 m

5

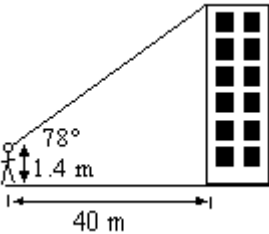
A wheelchair ramp at the entrance to a building forms an angle of  $3^\circ$  with the ground. If the ramp is 6.25 m long, how far from the base of the building is the bottom of the ramp? Give your answer to the nearest hundredth of a metre.



6.24 m

6

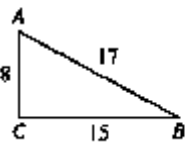
Barbara is standing 40 m from a building. When she looks to the top of the building, the angle of elevation is  $78^\circ$ . If Barbara is 1.4 m tall, how tall is the building?



189.6 m

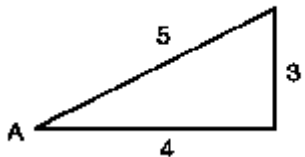
1

a) Use  $\triangle ABC$  to find  $\cos A$  and  $\tan B$ .



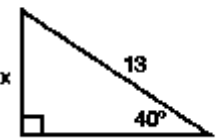
$\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{8}{17}$   
 $\tan B = \frac{8}{15}$

b) Find  $\cos A$ ,  $\sin A$ , and  $\tan A$ .



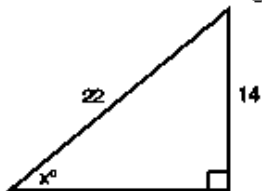
$\cos A = \frac{4}{5}$   $\sin A = \frac{3}{5}$   
 $\tan A = \frac{3}{4}$

c) Find  $x$  to the nearest hundredth.



$x = 8.36$

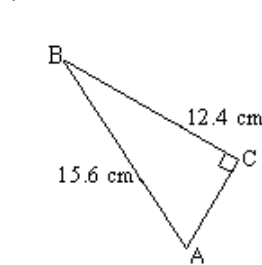
d) Find  $x$  to the nearest degree.



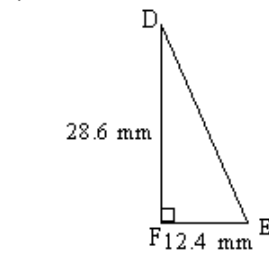
$x = 40^\circ$

2

Determine the measure of the acute angles in each triangle to the nearest tenth.

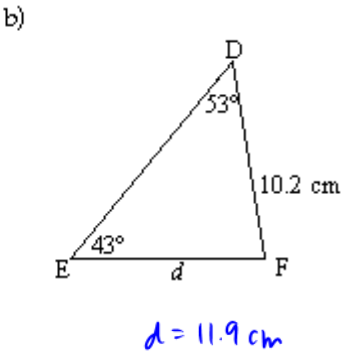
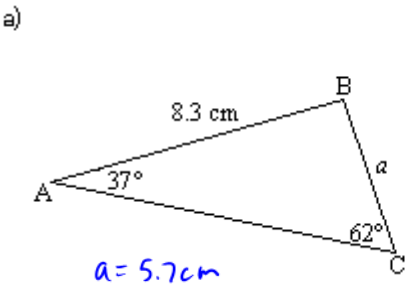


$\angle A = 52.6^\circ$   
 $\angle B = 37.4^\circ$

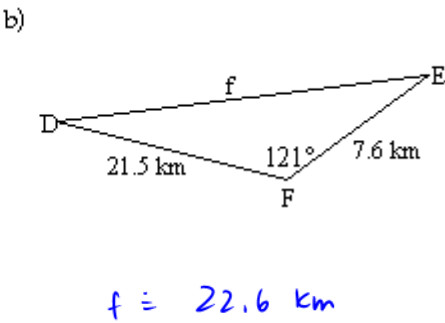
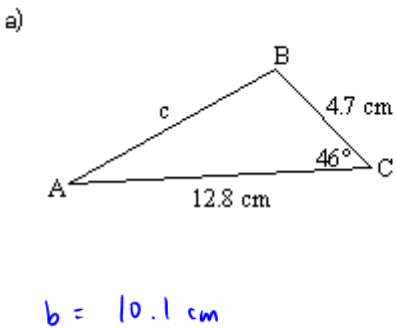


$\angle D = 23.4^\circ$   
 $\angle E = 66.6^\circ$

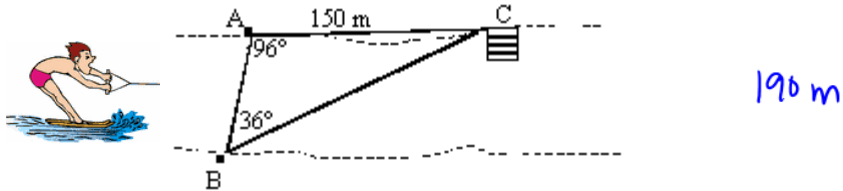
7 Determine the length of each indicated side. Round your answer to the nearest tenth of a centimetre.



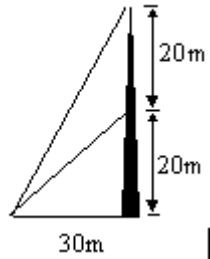
8 Calculate the length of the indicated side.



9 Two cottages, A and B, are on opposite sides of a river. A dock is located at point C on the same side as A. If  $\angle A = 96^\circ$ ,  $\angle B = 36^\circ$  and  $AC = 150\text{m}$ , how far apart are the cottages?

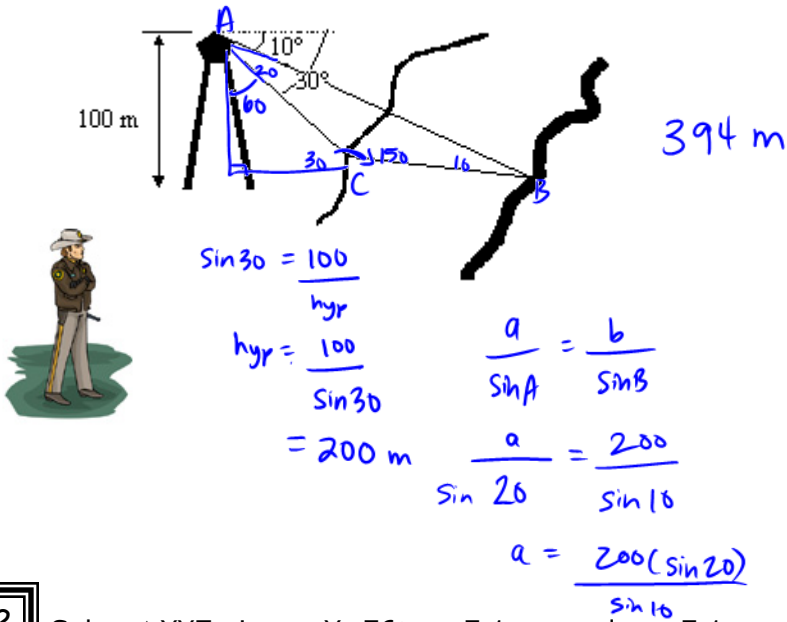


10 Two guy wires support a tower, as shown in the diagram. Determine the length of each wire.



Lower wire 36 m  
Upper wire 50 m

11 From the top of a 100-m fire tower, a ranger observes two different rivers on the same side of the tower. The angle of depression to the furthest river is  $10^\circ$  and to the nearest river is  $30^\circ$ . How far apart are the rivers?



12 Solve  $\triangle XYZ$  given  $\angle Y = 76^\circ$ ,  $x = 7.1 \text{ cm}$  and  $y = 7.1 \text{ cm}$ .

$\angle X = 76^\circ$   $\angle Z = 28^\circ$   $z = 3.4 \text{ cm}$

13 An executive must make a trip from Toronto to Ottawa, from Ottawa to Montreal, and then from Montreal back to Toronto. The distance from Montreal to Toronto is 550 km and from Montreal to Ottawa it is 205 km. If the angle joining the lines from Ottawa to Montreal and Montreal to Toronto is  $18^\circ$  how far is Ottawa from Toronto?



361 Km

14 Two trees are 90m apart. From a point midway between them, the angles of elevation to the tops of the trees are  $14^\circ$  and  $20^\circ$ . How much taller is one tree than the other?



5.2 m

15 A surveyor wishes to determine the height of a cliff on the other side of a river. She measures  $AC = 25\text{m}$ ,  $\angle C = 70^\circ$  and  $\angle DAB = 41^\circ$ . Determine the height of the cliff.

